
**SYSTEM AND METHOD OF AUTOMATICALLY ADJUSTING
AUTO CAPTURE SAFETY MARGIN**

Abstract of the Invention

An implantable stimulation device delivers a stimulation pulse in a chamber of a patient's heart and perform periodic threshold tests for generating a statistical model of the threshold data, to minimize the number of threshold tests required over a given time. Based on this statistical model, the stimulation pulse energy is automatically adjusted to a level that minimizes the risk of loss of capture. The autocapture safety margin is determined by the variability of the threshold data accumulated over time such that a minimum safety margin can be set to ensure that the delivered pulse energy always exceeds the threshold level. The timing of the trigger events is continuously adjusted to be proportional to the variability of the threshold data. If the standard deviation of the threshold measurements increases, the trigger would occur more often. If the standard deviation decreases, the trigger would be adjusted automatically to occur less often. In this way, when the threshold is less stable, more frequent threshold tests will result in more frequent adjustments to the stimulation pulse energy in accordance with the patient's need. When the threshold is stable, less frequent threshold tests are performed and fewer adjustments to the stimulation pulse energy are needed.